Illinois EPA Sampling Results Report for the Eagle Zinc NPL Site Buildings and Associated Structures (April 30-May 1, 2008)

ILD# 980606941

1358070001 – Montgomery County
Eagle Zinc Company NPL Site, Hillsboro, Illinois
Superfund/Technical Report

July 13, 2009

1358070001—Montgomery County
Eagle Zinc Company, Alternative NPL Site, Hillsboro, Illinois
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SECTION 1.0 INTRODUCTION

1.1 Purpose of Site Inspection and Sampling

During a period of 3 days, from April 30, 2008 to May 2, 2008, representatives from the Illinois Environmental Protection Agency's (Illinois EPA) Bureau of Land (BOL) entered the Eagle Zinc NPL site and conducted waste material and soil sampling within the Site's building and the adjacent areas. This sampling occurred to provide Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) remedial investigation sampling results information for the buildings at the Eagle Zinc Company (ILD 980606941) site located on Industrial Park Drive in Hillsboro, Montgomery County, Illinois. The sampling event was necessary to determine if there was contamination within and adjacent to the buildings. The sampling results expand upon the original Remedial Investigation (RI) sampling completed by Environ International Corp., contractor for T.L. Diamond Inc., site facility operator and property owner. The site buildings had been abandoned since early in 2003, becoming dilapidated, posing a physical safety risk to trespassers and others who may enter into them, and were suspected to be contaminated with inorganic materials from manufacturing, storage and disposal on-site.

In addition, on April 30 and May 1, 2008, Illinois EPA personnel and their contractors evaluated the buildings, related structures and equipment for potential demolition, recycling, and reuse. The inspection and sampling teams for April 30-May 2, 2008, Illinois EPA representatives included individuals from the Illinois EPA Office of Site Evaluation, the Field Operations Section (Springfield Regional Office), and the Federal Site Remediation Section (Superfund/NPL). Also present during the initial stage of the on-site building inspection, evaluation, and sampling event (April 30-May 2, 2008) were representatives from the U.S. EPA, City of Hillsboro, Montgomery County, and Environ International Corporation, environmental consulting firm for T.L. Diamond Corporation for the site.

The collected samples were analyzed for hazardous substances attributable to site manufacturing operations. The buildings and surround areas were not sampled during the initial RI activities because the facility was still operating at that time and were regulated under RCRA. The facility ceased operations in early 2003, and the entire site was placed

on the National Priorities List (NPL) in September 2007. Another objective was to investigate the structural condition of the buildings and determined if the site buildings, constructed of brick, concrete and metal contained hazardous building materials as asbestos. A third objective was to determine if the building materials (i.e., bricks, concrete, metals) were salvageable for beneficial reuse or recycling, and what type of materials (wood, asbestos) that would require disposal.

The initial inspection and sampling event was conducted under the authorization required by an Administrative Search Warrant issued on April 17, 2008. T.L. Diamond would not grant access to the Illinois EPA to enter and sample the site buildings. The Illinois EPA's sampling activity concentrated on the manufacturing and storage buildings located in the east-central area of the site. This area represents an area up to approximately 30% of the entire site, or as much as 39 acres, approximately.

SECTION 2.0 SAMPLING

2.1 Sampling Activities

Sampling activities were conducted on April 30, May 1, and May 2, 2008. Illinois EPA personnel collected a total of 65 XRF samples and 10 samples for laboratory analysis. During the sampling event, the Illinois EPA used a Niton X-Ray fluorescence (XRF) field based site characterization instrument. Site waste materials were collected and analyzed from numerous locations for inorganic, metals contamination. In addition to the XRF analysis of the waste materials, the sampling team collected and sent 10 samples to Prairie Analytical Laboratories in Springfield, Illinois for total metals and TCLP analysis. During the sampling event a Trimble global positioning instruments was used to record sampling locations and flags was used to mark the locations. All waste material sampling locations where photo-documented. Samples for laboratory analysis were collected using a stainless steel trowel. Following sample collection, all samples were transferred to containers provided by the Illinois EPA's Division of Laboratories. The sample containers were packaged and sealed in accordance with Illinois EPA's field sampling procedures. Samples were collected from a depth of approximately 1-2 inches of the surface waste materials.

2.2 Sampling Results Summary

The XRF analysis for the waste materials sampled, documented numerous samples contained total lead and other inorganic/metals) concentrations in excess of regulatory limits. The laboratory analysis also documented the fact that the majority of the confirmation samples would be classified as hazardous waste. In addition to lead, laboratory total metals analysis were completed for Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc. A TCLP metals analysis occurred for Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver, and Zinc.

The Illinois EPA noted upon receiving and reviewing the laboratory analytical results that a strong correlation did not exist between the XRF instrument readings and the laboratory analysis at a number of sample locations for lead. The laboratory results determined that total lead concentrations were two to five times greater than the concentrations documented with the XRF in the field. A discussion with the Niton XRF technical representative concluded that the field sampling results were approximately two to five times lower than the laboratory analyses due to the extremely high zinc concentrations being present in many of the samples, therefore "masking" the actual, higher lead concentration levels.

The main contaminants of concern within and adjacent to the buildings is inorganic metals, especially lead, that exceeds USEPA Region 5's industrial removal criteria. Potential risks exist for people (trespassers and workers) coming into contact with these waste materials. In addition, many of the buildings are approximately 100 years old and are dilapidated, thus posing a structural risk.

Over a dozen abandoned buildings remain on-site in various stages of disrepair. These buildings contain wastes materials, as well as the surrounding area, were sampled by the Illinois EPA (April 30, May 1-2). Significant contamination, especially for lead and zinc, was detected both within the buildings and the surrounding area. Most of the samples were characteristically hazardous for lead. Concentration levels for total Lead ranged from 3,860 ppm up to 56,576 ppm. TCLP results for Lead analysis ranged from 4.4 ppm up to 56 ppm in the buildings and adjacent soils. Nine of ten TCLP samples exceeded the 5 ppm (mg/L) TCLP limit for Lead, therefore hazardous by definition due to their toxicity characteristic. Cadmium total metals concentrations ranged from "0" ppm or non-detectable to 284 ppm. Cadmium TCLP levels ranged from 0.163 ppm to 4.08 ppm. Five of the 10 Cadmium samples exceeded the 1.0 ppm (mg/L), therefore failed are exhibit the characteristic of toxicity. Total metals for Zinc ranged from 70,600 ppm (mg/Kg) to 2,258,555 ppm (mg/Kg). TCLP for Zinc ranged from 978 ppm (mg/L) to 4,340 ppm (mg/L).

SECTION 3.0 SITE BACKGROUND

3.1 Site Description

The Eagle Zinc Company site is located on the west side of Industrial Park Drive in Hillsboro, Montgomery county, Illinois, at the northeast corner of Hillsboro, with a smaller section of vacant land lying east of Industrial Park Drive. It consists of approximately 132 acres and is legally described as having portions being located in the Southeast Quarter of Section One and the Northeast Quarter of Section Twelve. T.8N, R.4W; and part of the Southwest Quarter of Section Six, T.8N. R3W. The surrounding area consists of Industrial Park Drive on the east side with vacant land beyond. Smith Road borders the north side with a new water treatment facility, and a recreational further north. The west side of the site is irregular in shape in the southwest area, protruding

further west and is bordered by Brailly Road on the north. A public housing facility and private houses are located adjacent to and west of the site. Private businesses, including a wood treating facility and lumber yard, lie along the south boundary of the site.

The facility and site known as Eagle Zinc has been owned by various companies. These companies include Layon Zinc Company from 1912 to 1919. Eagle-Picher Industries purchased the facility in 1919 and owned and operated the site until late 1980. In November 1980, the facility was purchased by The Sherwin-Williams Company and sold in 1984 to Eagle Zinc Company, a division of T.L. Diamond. Eagle Zinc continued manufacturing zinc oxide until the facility closed in early 2003.

The Eagle Zinc site in Hillsboro, Illinois is approximately 132 acres in size and located in a mixed commerical-industrial and residential area in the northeastern part of Hillsboro. The site operated as a zinc smelter from 1912 until 2002. Site Operations included zinc smelting, and manufacturing of sulfuric acid, metallic zinc, zinc oxide and leaded zinc oxide.

Operational wastes generated at the Site have included rotary kiln zinc-oxide slag, other zinc-oxide waste residue, muffle dross, metallic zinc particles, and refractory bricks from the facility's furnaces, spent solvent degreasers, and acidic waste waters. These waste materials were disposed of and/or distributed across the site grounds, and in large residual material waste piles. On-Site Disposal of Wastes apparently occurred for all operation waste materials generated on-site. The total site area covered by residue waste materials, including buildings, is approximately 70 or more acres of the 132 acre site.

Site buildings and related structures are generally of brick, metal and cement construction, with some wood. In addition, the site contains numerous concrete pads and storage tank support structures. The building and manufacturing-storage structures comprise approximately 30 percent of the site area, or approximately 39 acres of the surface area of the site. Approximately 26 acres are under roof, with approximately 27 buildings on-site. The Site also previously contained underground fuel storage tanks. In addition to the manufacturing building, materials storage areas, waste material piles, the Site contains railroad sidings (predominately in the southern most Site area).

Also the site contains two ponds, two constructed surface water run-off retention basins (ponds) within the manufacturing area. Other areas of the site contain two main drainage ways and intermittent streams, and wetlands adjacent to the ponds and drainage ways and intermittent streams. The ecology of the ponds, wetlands, and drainage ways and intermittent streams are seriously degraded due to metals contamination and low pH from the storm water run-off from the site.

Apparently, the less developed far north central area of the Site was historically used for growing agriculture crops, which ceased in the 1980s. The adjacent north-central area contains heavily degraded vegetation possibly due to contaminated storm water run-off and related chemical impacts due to the storm water run-off containing metals contamination that made the soils too acidic.

3.2 Site Regulatory History

Prior to the RI/FS

- The Eagle Zinc facility was listed on the Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) on June 1, 1981.

- On May 22, 1998, Eagle Zinc entered into an Interim Consent Order (ICO) with the Illinois Attorney General and IEPA. The ICO contained an interim site plan for: (1) preparation and submittal of a Storm Water Pollution Prevention Plan (SWPPP), (2) sampling of on-site materials, (3) sampling of storm water discharges, (4) development and implementation of a ground water monitoring plan, and (5) disposal of construction and demolition debris.

- The site sampling and investigation resulted in the submission of the March 1999 reports entitled Monitoring Well Installations and Ground Water Sampling Interim Report to the IEPA and Interim Report of Residue Sampling and Analysis.

- Based on the Site's discharge of storm water from two point sources, the occurrence of "regulated industrial practices at the Site, and the facility's SIC code, the Site was determined to be subject to National Pollutant Discharge Elimination System (NPDES) storm water permitting requirements. In June 2000, the Illinois EPA issued a NPDES permit. The SWPPP was prepared in December 2000. A storm water retention system, which consists of a two-cell retention basin, was completed in 2001.

- The U.S. EPA's Administrative Order on Consent ("AOC") with the Statement of Work ("SOW") was signed on December 31, 2001 for the RI/FS.

- *The Eagle Zinc site was proposed for the National Priorities List (NPL) on March 7, 2007. This site was finalized as an NPL site on September 19, 2007. As a finalized NPL site, the Eagle Zinc site is fully subject to all CERCLA authorities and funding from the Superfund Program.*

- An Administrative Search Warrant was issued on April 17, 2008, to inspect and evaluate the site's buildings and related structures for possible demolition and to collect waste material samples for contamination testing from within and adjacent to the buildings.

3.3 Site RI/FS Document Summary

RI/FS History and Documents Submitted

The RI/FS began in early 2002. The Remedial Investigation and related reports were completed by Environ and reviews finished by the USEPA and Illinois EPA in April 2006. The FS documents were submitted by Environ and the related reviews completed in May 2006. Due to the IEPA's concerns with Environ's FS documents, the Illinois EPA requested that the USEPA take over the completion of the FS. The USEPA tasked their contractor CH2MHILL to provide addendums in the form of two technical memoranda to Environ's FS document. The documents for the RI/FS include the following:

- Preliminary Site Evaluation Report (March 2002)
- Remedial Investigation/Feasibility Study Work Plan (July 2002)
- Technical Memorandum Phase 1 – Source Characterization (March 2003)
- Technical Memorandum Phase 2 – Migration Pathway Assessment (November 2003)
- Human Health Risk Assessment (August 2004)
- Ecological Risk Screening Evaluation (August 2004)
- Remedial Investigation Report (February 2005)
- Eagle Zinc Company Site – Review of Nature, Extent of Contaminants, and Risk Assessment (August 2005)
- Addendum to Remedial Investigation Report (February 2006)
- Revised Feasibility Study (March 2006)
- Feasibility Study Supplement Memoranda: Evaluations of Alternatives for the Eagle Zinc Company Site, Hillsboro, Illinois (July 2006)
- Feasibility Study Supplement Report (May 2008)
- Manufacturing Buildings Area Sampling Results and Report (2008/2009)
- USEPA Proposed Plan Interim Cleanup for Buildings and Associated Structures (April 2009)

3.4 Contaminants of Concern and Media Site Summary

Contaminated media of concern for the Eagle Zinc site include the abandoned buildings, residue piles, soil sediments, surface water, groundwater.

Contaminants of Concern and Media (RI Report, Addendum to RI, FS Technical Memos)

Buildings:	Arsenic, Cadmium, Lead, and Zinc
On-Site Soil:	Arsenic, Cadmium, Lead, and Zinc
Residue Waste Piles:	Aluminum, Arsenic, Cadmium, Cobalt, Copper, Iron, Lead, Manganese, Nickel, Silver, and Zinc
Ground Water:	Arsenic, Beryllium, Cadmium, Chromium, Iron, Lead, Manganese, Nickel, Sulfate, Thallium, Vandadium, and Zinc
Surface Water:	Aluminum, Arsenic, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Mercury, Nickel, Sulfate, Zinc, Cis 1,2-Dichloroethene, and Trichloroethene
Sediment - Western Drainageway:	Antimony, Arsenic, Beryllium, Cadmium, Cobalt, Copper, Lead, Manganese, Mercury, Nickel, Silver, Thallium, Zinc, and Vinyl Chloride
Sediment - Eastern Drainageway:	Antimony, Arsenic, Beryllium, Cadmium, Cobalt, Copper, Lead, Manganese, Nickel, Silver, Thallium, Zinc, and Vinyl Chloride

Private and Public Water Supply Wells

- The PRPs contractor, Environ, conducted an one-mile radius search of potential supply wells using an on-line search of well records maintained by the Illinois DNR. There are no community water supply wells located within 2,500 feet of the Site boundaries.

- However, numerous domestic wells were reported by the Illinois State Water Survey as being located within a one-mile radius of the Site, in the area known as Lakewood Knolls and immediately west of Lake Hillsboro. Environ states that the Lakewood Knolls homes were connected to the public water supply system during the 1980s and 1990s. However, some older domestic well may be in use for non-portable outdoor purposes such as gardening and lawn watering.

- According to the Montgomery County Health Department there are no local ordinances prohibiting the use of private wells, and all residents of Hillsboro are provided with public water obtained from Lake Hillsboro and Glen Shoals Lake.

Demography and Land Use

- According to the 2000 census, approximately 2,800 people live within a one-mile radius of the Site and approximately 9,300 people live within a five-mile radius of the Site. The Site is located in a mixed commercial/industrial/residential area in the northeastern part of Hillsboro.

- A residential area containing both single-family and multi-family dwellings, including public housing, is located approximately 200 feet west of the southern and central part of the Site.

- This area is also the closest to the waste piles, and the Site's largest pond and a major drainageway that drains via an unnamed tributary to the Middle Fork of Shoal Creek and then to Glen Shoals Lake, a public drinking water source. Lake Hillsboro, a drinking water source is less than 2,300 feet from the Site, and surface water from the northern and eastern Site areas drains into the lake.